

EVIDENCE OF THE LEAKAGE OF MHD OSCILLATIONS ABOVE ON-DISK CORONAL HOLE

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We analyze the temporal image data of the on-disk coronal hole as observed on 31 March 2007 by the XRT/Hinode telescope and Al-poly filter. We choose this temporal image data of 30 s cadence from 11:34:48 UT to 14:19:35 UT to study intensity oscillations above the on-disk coronal hole, when the exposure time of each XRT image was 8.193 s. Using Fourier filtering method, we reconstruct X-ray light curve for the periods outside the cone-of-influence (COI) of its power spectrum. Using the standard wavelet software, we derive the power spectra of the reconstructed light curves which are generated by filtering the original X-ray time series at various Fourier scales outside the COI period. This procedure provides statistically significant and globally distributed multiple periodicities in the intensity and global wavelet power spectra. We observe the multiple periodicities above the on-disk coronal hole as 27.27 min, 13.64 min and 6.82 min. We interpret the first two observed periodicities as the most likely signature of magnetoacoustic wave harmonics that are probably excited in the lower solar atmosphere and leak through open field lines. The third periodicity is most probably generated due to recurrent magnetic reconnection at the boundaries of the on-disk coronal hole.